

Lesson 1.4 Midpoints and Bisectors

Sunday, August 30, 2026 6:08 PM

Click link below for interactive Pear Deck

PowerPoint Lesson:

<https://app.peardeck.com/student/tlgehoksd>



Lesson 1.4
Midpoints...

Lesson 1.4

Midpoints and Bisectors

Content Objective

Students will find midpoints
and bisect line segments.



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Florida's B.E.S.T. Standards for Mathematics

MA.912.GR.3.3

Use coordinate geometry to solve mathematical and
real-world geometric problems involving lines, circles,
triangles and quadrilaterals.

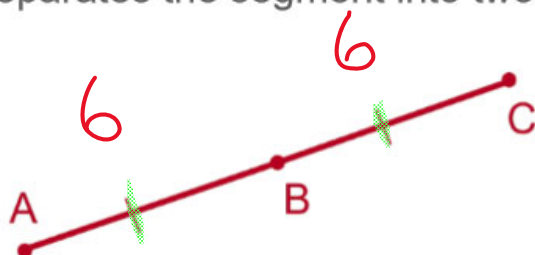
MA.912.GR.5.2

Construct the bisector of a segment or an angle,
including the perpendicular bisector of a line segment.

Learn

Midpoints on a Number Line

The **midpoint** of a segment is the point **halfway between the endpoints of the segment**. A point is **equidistant** from other points if it is the same distance from them. The midpoint separates the segment into two segments with a ratio of 1:1.

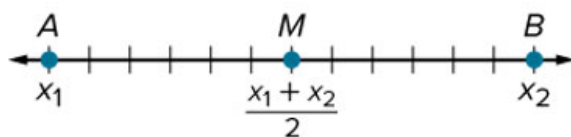


Learn

Midpoints on a Number Line

Key Concept: Midpoint on a Number Line

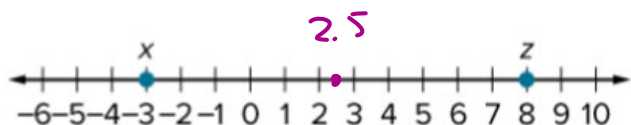
If $\overline{AB}$ has endpoints at x_1 and x_2 on a number line, then the midpoint M of $\overline{AB}$ has coordinate $M = \frac{x_1 + x_2}{2}$.



Example 1

Find the Midpoint on a Number Line

Find the coordinate of the midpoint of $\overline{XZ}$.



$$\frac{8 + (-3)}{2} = \frac{5}{2} = 2.5$$

Example 1

Find the Midpoint on a Number Line



$$\begin{aligned} M &= \frac{x_1 + x_2}{2} \\ &= \frac{8 + (-3)}{2} \\ &= \frac{5}{2} \text{ or } 2.5 \end{aligned}$$

Midpoint Formula

Substitution

Simplify.

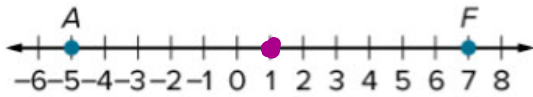
The coordinate of the midpoint of $\overline{XZ}$ is 2.5.

Example 1

Find the Midpoint on a Number Line

Check

What is the coordinate of the midpoint of $\overline{AF}$?



$$\frac{-5 + 7}{2} = \frac{2}{2} = 1$$

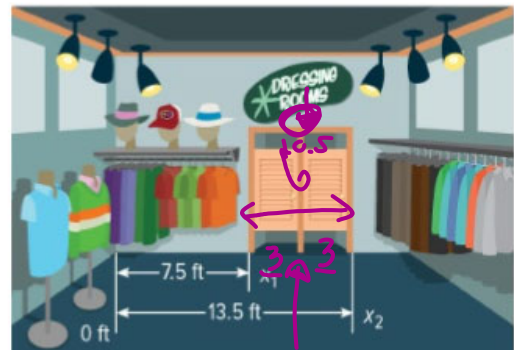
Example 2

Midpoints in the Real World

SIGNS Mariella works at a vintage clothing store. She wants to hang a new sign so it is centered above the dressing-room doors. Given that the dressing-room doors have the same width, find the point along the wall that Mariella should hang the new sign.

$$\frac{13.5}{2} = 6.75$$

$$\frac{6}{2} = 3$$



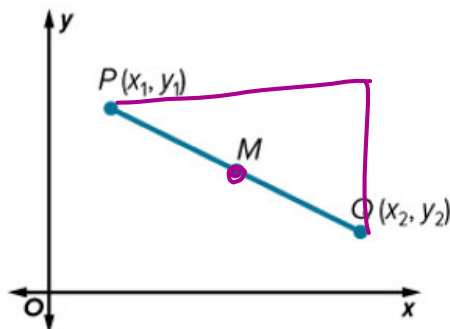
$$7.5 + 3 = 10.5 \text{ ft}$$

Learn

Midpoints on the Coordinate Plane

Key Concept: Midpoint Formula on the Coordinate Plane

If $\overline{PQ}$ has endpoints at $P(x_1, y_1)$ and $Q(x_2, y_2)$ on the coordinate plane, then the midpoint M of $\overline{PQ}$ has coordinates $M\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$.



Example 3

Find the Midpoint on the Coordinate Plane

Find the coordinates of M , the midpoint of $\overline{AB}$, for $A(-2, 1)$ and $B(8, 3)$.

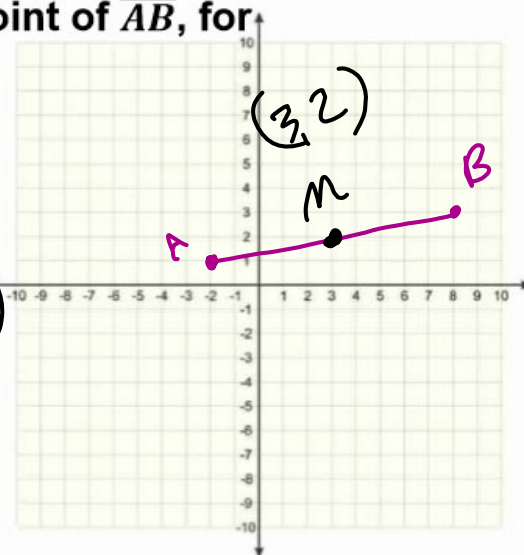
$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

$$\frac{-2 + 8}{2}, \frac{1 + 3}{2}$$

$$\frac{6}{2} = 3$$

$$\frac{4}{2} = 2$$

$(3, 2)$



Example 3

Find the Midpoint on the Coordinate Plane

Find the coordinates of B , the midpoint of $\overline{AC}$, for $A(-3, -2)$ and $C(5, 10)$.

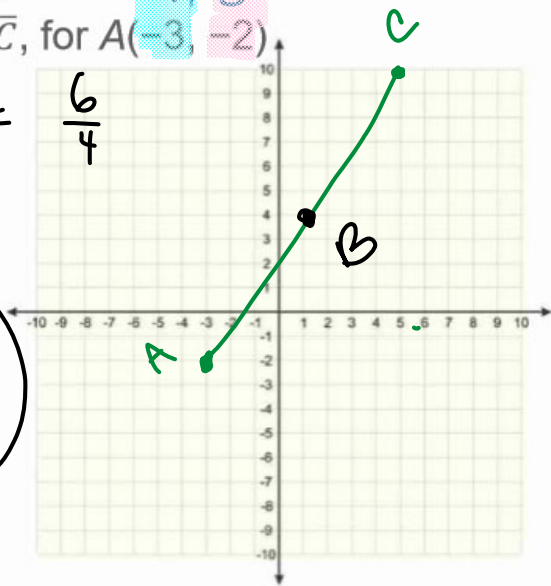
$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

$$\frac{-3 + 5}{2} = 1, \quad \frac{-2 + 10}{2} = 4$$

$$(1, 4)$$

$$\frac{12}{8}$$

$$\frac{6}{4}$$



Example 4

Find Missing Coordinates

Find the coordinates of A if $P(3, \frac{1}{2})$ is the midpoint of $\overline{AB}$ and B has coordinates $(8, 3)$.

$$\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}$$

$$\frac{3 + 8}{2} = 5.5, \quad \frac{0.5 + 3}{2} = 1.75$$

$$(5.5, 1.75)$$

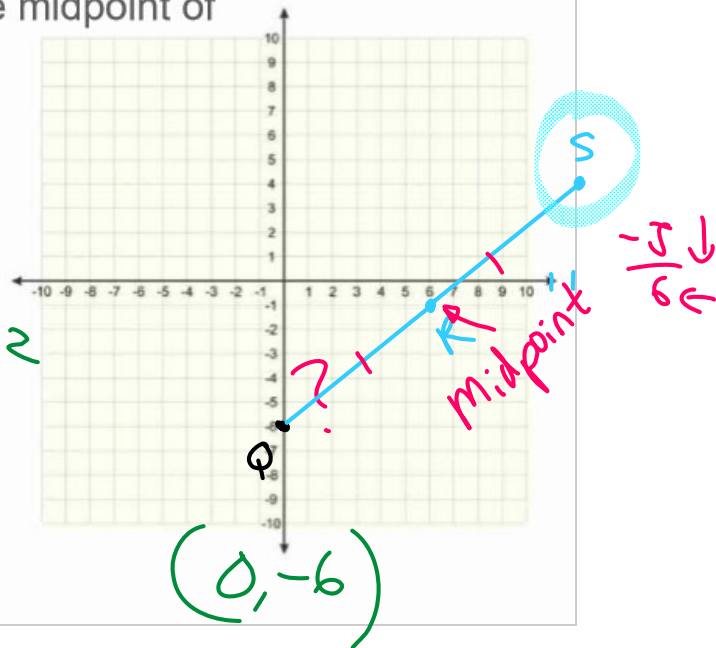
Example 4

Find Missing Coordinates

Find the coordinates of Q if R(6, -1) is the midpoint of $\overline{QS}$ and S has coordinates (12, 4).

midpoint

$$\frac{x_1 + x_2}{2} = 6 \quad \frac{y_1 + y_2}{2} = -1$$
$$\frac{12 + x}{2} = 6 \quad \frac{4 + y}{2} = -1$$
$$12 + x = 12 \quad 4 + y = -2$$
$$x = 0 \quad y = -6$$

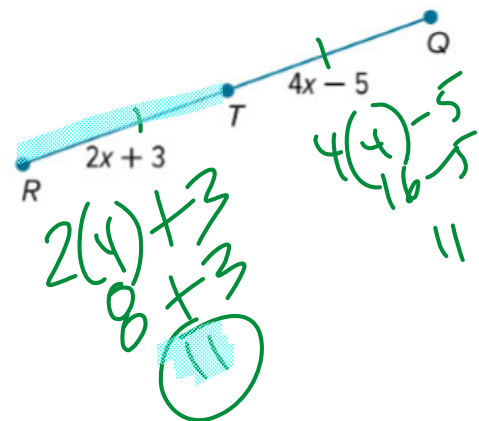


Example 5

Find Missing Measures

Find the measure of $\overline{RT}$ if T is the midpoint of $\overline{RQ}$.

$$2x + 3 = 4x - 5$$
$$\begin{array}{r} 2x + 3 \\ - 2x \\ \hline 3 = 2x - 5 \\ + 5 \quad + 5 \\ \hline 8 = 2x \\ \frac{8}{2} = \frac{2x}{2} \end{array}$$
$$x = 4$$



Example 5

Find Missing Measures

Find the measure of $\overline{RS}$ if S is the midpoint of $\overline{RT}$.

- A. 56
- B. 58**
- C. 112
- D. 116

$$63 - 5$$
$$7(9) - 5$$



$$7x - 5 = 6x + 4$$

$$\begin{array}{r} 7x = 6x + 9 \\ -6x \quad -6x \\ \hline \end{array}$$

$$x = 9$$

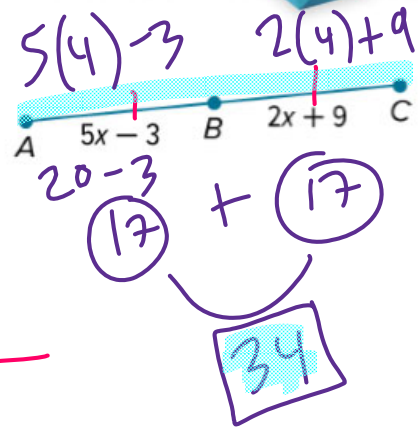
Example 6

Find the Total Length

Find the measure of $\overline{AC}$ if B is the midpoint of $\overline{AC}$.

$$5x - 3 = 2x + 9$$

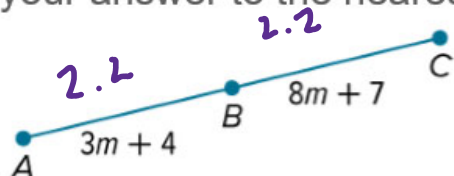
$$\begin{array}{r} 5x - 3 = 2x + 9 \\ -2x \quad -2x \\ \hline 3x = 12 \\ \frac{3x}{3} = \frac{12}{3} \\ x = 4 \end{array}$$



Example 6

Find the Total Length

Find the measure of $\overline{AC}$ if B is the midpoint of $\overline{AC}$. Round your answer to the nearest tenth, if necessary.



$$\begin{array}{r} 3m + 4 = 8m + 7 \\ -3m \quad \quad -3m \\ \hline \end{array}$$

$$-0.6 = n$$

$$\begin{array}{r} 4 = 5m + 7 \\ -7 \quad \quad -7 \\ \hline -3 = 5m \\ \frac{-3}{5} = \frac{5m}{5} \end{array}$$